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MEMORANDUM

Site: Zykan Landfill
ID #: MO0001574680
Break: 1.2
Other: E & E
5-7-99

TO: Paul Doherty, EPA/START PO

FROM: Ron Ramold, E & E/STM RR

THRU: Robert Overfelt, CPG, E & E START PM RCO

DATE: May 7, 1999

SUBJECT: Trip Report: Zykan Landfill site ESI , Wright City, Missouri

TDD: S07-9706-014
PAN: 0567ZLSRXX
CERCLIS No.: MO0001574680
EPA/SAM: Bryant Burnett
EPA/OSC: Jeff Weatherford

INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the U.S. Environmental Protection Agency (EPA) Region 7 Site Assessment and Cost Recovery (SACR) program has tasked the Ecology and Environment, Inc., (E & E) Superfund Technical Assessment and Response Team (START) to perform an Expanded Site Inspection (ESI) at the Zykan Landfill site near Wright City, Missouri, under Technical Direction Document (TDD) S07-9706-014. The following sections include a brief description and history of the site, followed by a report of ESI field activities.

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BACKGROUND

Site Location

The site is located within the south half of section 32, Township 47 North, Range 1 West (Attachment 1: Figure 1: Site Location Map). The site lies in the northeastern corner of Warren County, approximately 3 miles south-southwest of Wright City, Missouri, and approximately three-quarters of a mile south of the intersection of Highway M and Muenz Road. The site's geographic coordinates are latitude 38°47'14" N and longitude 91°2'48" W.

Site Description

The site consists of two adjacent former landfills: a sanitary landfill to the south and a hazardous waste landfill to the north (Attachment 1: Figure 2: Site Area Map). For the purposes of this investigation, both the sanitary landfill and the hazardous waste landfill were investigated as a single site.

The Zykan Landfill site encompasses approximately 17 acres, including approximately 5 acres in the sanitary landfill (MDNR, 1996) and approximately 12 acres in the hazardous waste landfill (EPA, 1986). Intermittent streams border the site to the south and east. To the west lies a junkyard that was a proposed landfill expansion area in 1986 (WCC, 1986). Land use surrounding the site is a mixture of agricultural, residential, and recreational.

Two intermittent streams provide surface drainage of the site. The first runs roughly south-southeast and lies immediately east of the hazardous waste landfill and the northern portion of the sanitary landfill. The second enters the site from the east and flows roughly southwest across the southern border of the sanitary landfill. The confluence of these two intermittent streams is on the east boundary of the landfills, approximately 400 feet south of the boundary between the two landfills. After leaving the site, the intermittent stream runs approximately 4,000 feet southwest to Lake Lucern, the first of two downstream man-made lakes.

Geology beneath the site consists of an 80-180-foot-thick-layer of glacial till, which overlies a limestone paleovalley. The upper portion of the till is oxidized and fractured to depths as great as 60 feet. Coarser (sand and gravel) alluvial deposits lie in the streamed of the intermittent stream.

Site History

Bob's Home Service, Inc. (BHS), owned by James Zykan, operated both landfills. The sanitary landfill operated under the name "Zykan Landfill" from 1971 to 1977; the hazardous waste landfill operated under "BHS Industrial Waste Disposal Facility" and "BHS Hazardous Waste Landfill" from 1977 to 1985.

An integrated Preliminary Assessment/Site Inspection (PA/SI) of the sanitary landfill was initiated by MDNR in early 1996 (MDNR, 1996). Citing the underlying thickness of low-permeability glacial till, the report concluded that ground water contamination is unlikely, but the report also concluded that surface water contamination is a possibility. MDNR personnel observed both an area of leachate release and several exposed 55-gallon drums along the south side of the sanitary landfill. At least one of the drums was leaking. MDNR (1996) sampling and analysis of the leachate, the drums, and nearby soil indicated the presence of benzene, ethylbenzene, xylenes, and 2, 4-D, 2-hexanone, tetrachloroethylene, and several polyaromatic hydrocarbons (PAHs) with a high potential for food chain bioaccumulation.

During a July 1997 site reconnaissance, START observed the continued flow of leachate near the southern boundary of the Zykan Landfill (E & E, 1997a). In response, EPA performed a removal action along the southern boundary of the sanitary landfill. Response actions took place from November 1997 through February 1998 and included placing soil fill over both the erosion gully and the leachate outbreak. In addition, soil fill was placed in sunken areas, and drainage control measures (silt fencing and vegetative seeding) were implemented to reduce infiltration into the landfill (EPA, 1997 and 1998).

Since early 1986, the Missouri Department of Health (MDOH) has been conducting annual sampling and analysis of water samples from several private wells in the vicinity of the site (MDNR, 1996). Samples have been analyzed for 15 metals, 57 VOCs, 6 chlorinated pesticides, and 2 chlorophenoxy herbicides (MDOH, 1996). To date, MDOH has not detected any contamination in any of the private wells (MDOH, 1998).

Throughout the history of the hazardous waste landfill, some form of ground water monitoring has been required by either MDNR or EPA regulations. For the hazardous waste landfill, ground water monitoring began around the hazardous waste landfill in 1977. Several sets of monitoring wells have been installed to help fulfill the required ground water sampling and analysis. Ground water monitoring under the Resource Conservation and Recovery Act (RCRA) began in 1981 (EPA, 1986). Though well construction, sampling plans, and sampling practices do not appear to be consistent, there did not appear to be a documented release of contamination to ground water from the hazardous waste landfill through 1986. Post-closure monitoring of selected monitoring wells and the hazardous waste landfill's leachate collection system has been ongoing

since 1986. To date, there does not appear to be a release of contamination from the hazardous waste landfill to ground water.

In 1997, START was tasked by Region 7 EPA to conduct a file review of information relating to the sanitary landfill. Based on the file review and a Hazard Ranking System (HRS) evaluation, START concluded that surface water contamination may pose the greatest potential threat to human health and the environment. START identified two mechanisms by which contamination could enter surface water. The first consists of landfill leachate reaching surface water by way of temporary surface water flow in the intermittent streams. A second possibility is that shallow contaminated ground water, being topographically driven, could enter the alluvium of the intermittent streams and flow downgradient to surface water (E & E, 1997b). This threat could be of particular concern, given the high potential for bioaccumulation of some of the contaminants identified in the soil along the southern boundary of the sanitary landfill.

OBJECTIVES

The primary objectives of this ESI include:

- to identify and document any potential observed release to, and actual contamination of, surface water from either the sanitary landfill or the hazardous waste landfill,
- to identify and document any potential observed releases of contamination to ground water from either the sanitary landfill or the hazardous waste landfill,
- to identify and document any potential ground water targets subject to actual contamination,
- to determine whether additional ground water monitoring wells screened in the alluvium of the intermittent stream are necessary, and
- to characterize source contaminants in the hazardous waste landfill.

To achieve these objectives, START collected surface water, sediment, and ground water samples on and near the site. In addition, START collected samples from the hazardous waste landfill's leachate collection system and soil samples from the bed of the intermittent stream.

FIELD ACTIVITIES

The Zykan Landfill site ESI field team consisted of START members (STMs) Tracy Braig, Denny Cox, Patty Currier, Jeff Fletcher, Mike Keller, Ron Ramold, Randy Schademann, and Chuck Smith. The project manager for the investigation is STM Ramold. Cox served as the Site Safety Officer (SSO). The START departed Kansas City at approximately 0830 hours on April 26, 1999. After picking up various rented equipment

and supplies, START arrived on site at approximately 1330 hours on the 26th. Field work lasted until 1230 hours on April 30, 1999.

Activities included sampling of leachate sumps, temporary Geoprobe™ monitoring wells, permanent monitoring wells, private wells, surface water, surface water sediment, and intermittent stream bed soil. The following section describes sampling locations and methods for each of these sampling tasks. Table 1 (Attachment 2) presents a summary of samples submitted to the Region 7 EPA Laboratory. Table 2 (Attachment 2) provides property ownership information for all samples.

Sampling Locations and Methods

Aqueous samples were taken from three sumps draining the hazardous waste landfill. These included the main leachate sump and the sumps draining interceptor trenches 1, 2, and 3 (Attachment 1: Figure 3: Leachate Sump Sampling Location Map). START collected the samples using new, disposable bailers.

START collected ground water samples from eight temporary Geoprobe™ monitoring wells. All samples were taken from ground water within the alluvium of the intermittent stream. Sampling locations are shown in Figures 4 and 5 (Sampling Location Map-1 and Sampling Location Map-2, respectively) in Attachment 1. Due to heavy rains, surface water flow in the intermittent stream bed prevented access with the tracked Geoprobe™ unit. As a result, START installed the temporary wells by hand using a post driver. Wells were driven to refusal [approximately 6 feet below ground surface (BGS)]. START then exposed the screen using a hand jack. Within the intermittent stream bed, sampling locations were chosen so as to prevent direct surface water intrusion into the borehole. Due to the heterogeneous nature of the alluvial deposits, several attempts to obtain ground water were usually necessary. Sampling details were recorded on temporary monitoring well sampling data sheets.

START collected ground water samples from 14 permanent monitoring wells. The locations of these wells are shown in Figure 6 (Monitoring Well Sampling Location Map) in Attachment 1. Before sampling, all wells were purged by either removing three times the volume of standing water within the well or by bailing the well dry, whichever was occurred first. Purging records were kept on monitoring well purge data sheets. All purge water was collected and drummed on site. Samples were collected using either dedicated bailers or new disposable bailers. Initially, 17 monitoring wells were to be sampled. However, obstructions in the two K wells that were proposed for sampling prevented sampling of these monitoring wells.

START collected ground water samples from three private wells (private wells 6, 7, and 15) to the north and northeast of the landfill. The locations of these wells is shown in Figure 7 (Private Well Sampling Location Map) in Attachment 1. The fourth private well proposed for sampling (private well 4) is no longer in use. The resident of the property informed START that water is supplied from a rural water system.

Collocated surface water and surface water sediment samples were collected from eight locations within or near Lake Lucern. Sampling locations are shown in Figure 8 (Surface Water and Surface Water Sediment Sampling Location Map) in Attachment 1. START collected surface water samples by either directly filling the sample containers in shallow water or with the aid of a Kemmerer sampler in deeper water. Surface water sediment samples in shallow water were collected using new disposable stainless steel spoons; samples in deeper water were collected using an Eckman dredge. Sampling details were recorded on surface water and surface water sediment sampling data sheets.

Soil samples were taken from the alluvium of the intermittent stream bed. Sampling locations were collocated with those of the temporary Geoprobe™ monitoring wells and are shown in Figures 4 and 5. START collected the soil samples using new disposable stainless steel spoons.

SUMMARY

START conducted field work for the Zykan Landfill site ESI during the week of April 26, 1999. Samples were collected from leachate collection sumps, both temporary and permanent monitoring wells, private wells, surface water, surface water sediment, and soil of the intermittent streamed. A full interpretation of all analytical data will be included in the final ESI report and HRS memorandum.

REFERENCES

Ecology and Environment, Inc. (E & E), 1997a, Site Reconnaissance Trip Report for Zykan Landfill, Wright City, Missouri, EPA Region 7 START, TDD S07-9610-014, August 6, 1997.

_____, 1997b, Site Summary and HRS Evaluation: Zykan Landfill Site, Warren County, Missouri, EPA Region 7 START, TDD S07-9706-014, September 30, 1997.

Environmental Protection Agency (EPA), 1986, Update of the Hazardous Waste Ground-Water Task Force Evaluation of the B.H.S., Inc., Wright City, Missouri, Facility, December 11, 1986.

_____, Region 7, 1997, Action Memorandum, Request for a Removal Action at the Zykan Landfill Site (a/k/a/ Bob's Home Service) in Wright City, Missouri, September 29, 1997.

_____, 1998, Pollution Report, Zykan Landfill Site, Wright City, Missouri, February 24, 1998.

Missouri Division of Health (MDOH), 1996, Scott A. Clardy, to Walter Gerdeman, Letter, April 12, 1996.

_____, 1998, Angela Baker, to Ron Ramold, Ecology and Environment, Inc., Memorandum, September 11, 1998.

Missouri Department of Natural Resources (MDNR), 1996, Missouri Department of Natural Resources (MDNR), Integrated Preliminary Assessment/Site Inspection Report, Zykan Landfill site, (AKA Bob's Home Service Sanitary Landfill, Warren County, Missouri, August 30, 1996.

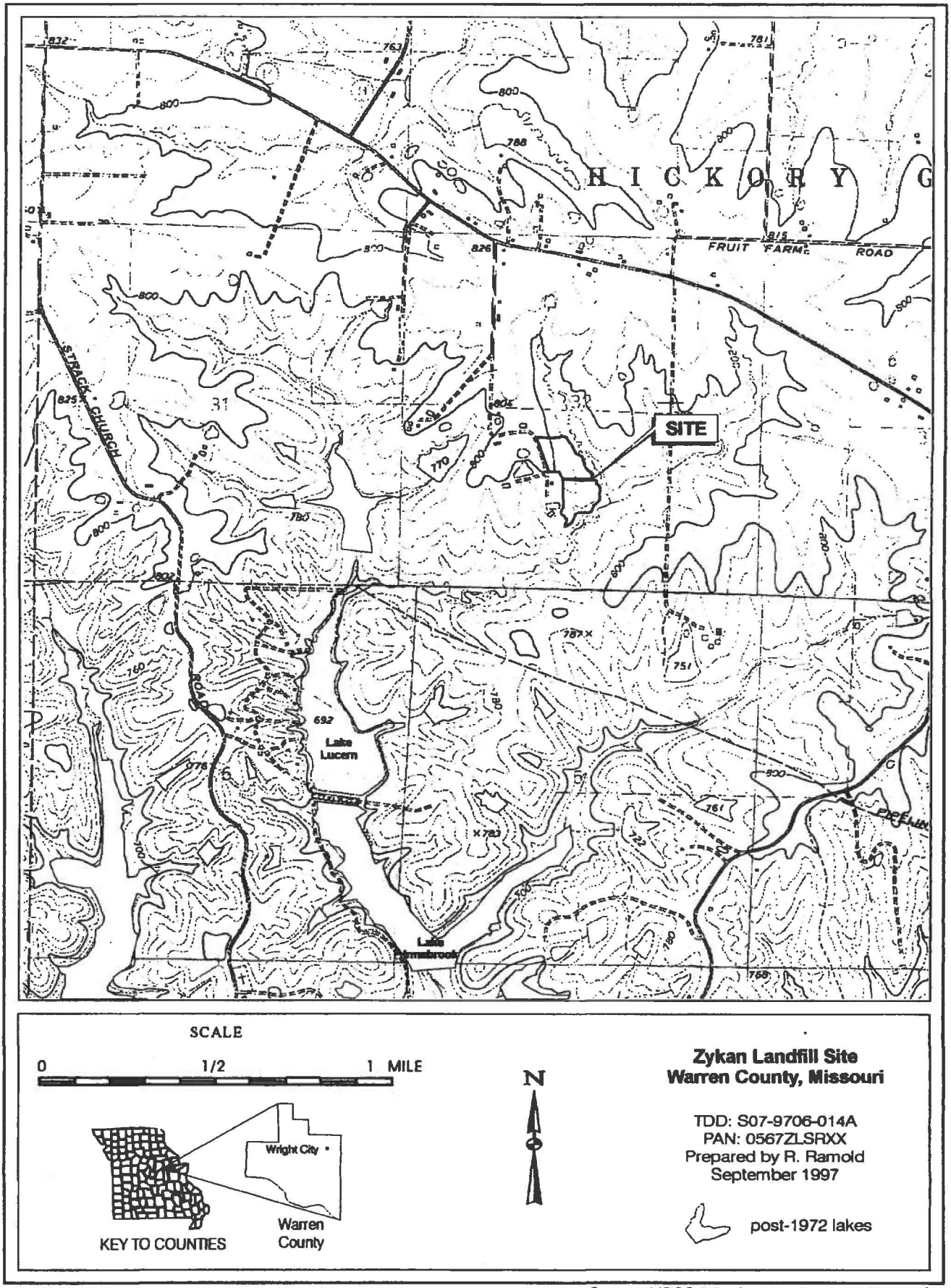
Woodward-Clyde Consultants (WCC), 1986, B.H.S., Inc., Treatment, Storage and Disposal Facility, RCRA Part B Permit Application, vol. 11 and 12, February 14, 1986.

ATTACHMENTS:

A. Figures
B. Tables

ATTACHMENT A

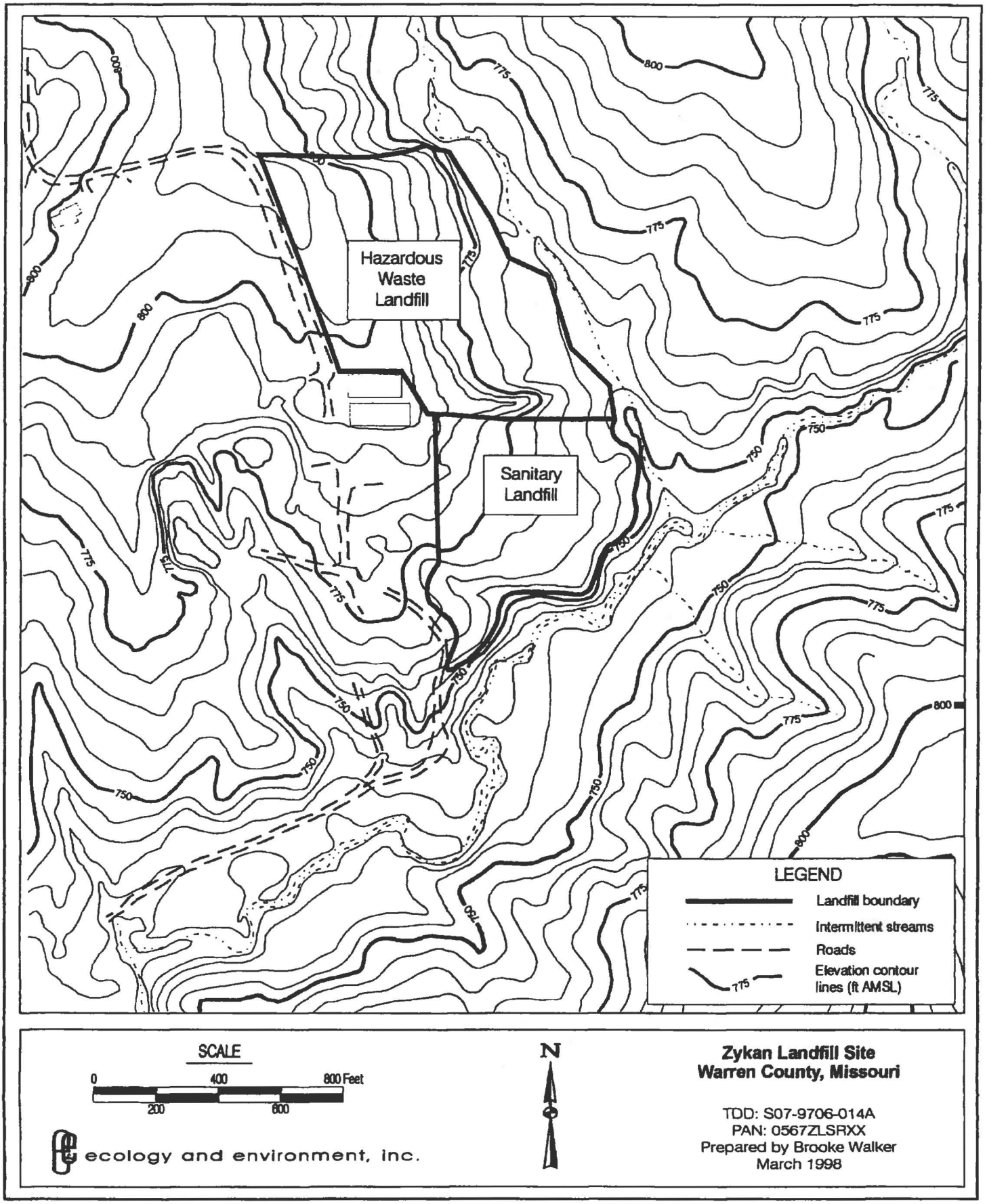
Figure 1: Site Location Map
Figure 2: Site Area Map
Figure 3: Leachate Sump Sampling Location Map
Figure 4: Sampling Location Map-1
Figure 5: Sampling Location Map-2
Figure 6: Monitoring Well Sampling Location Map
Figure 7: Private Well Sampling Location Map
Figure 8: Surface Water and Surface Water Sediment Sampling Location Map



g:\9706-014\zyksloc.cdr

Source: USGS 7.5 minute series, 1972 Wright City Quadrangle, Missouri with modifications from Village of Innsbrook Map

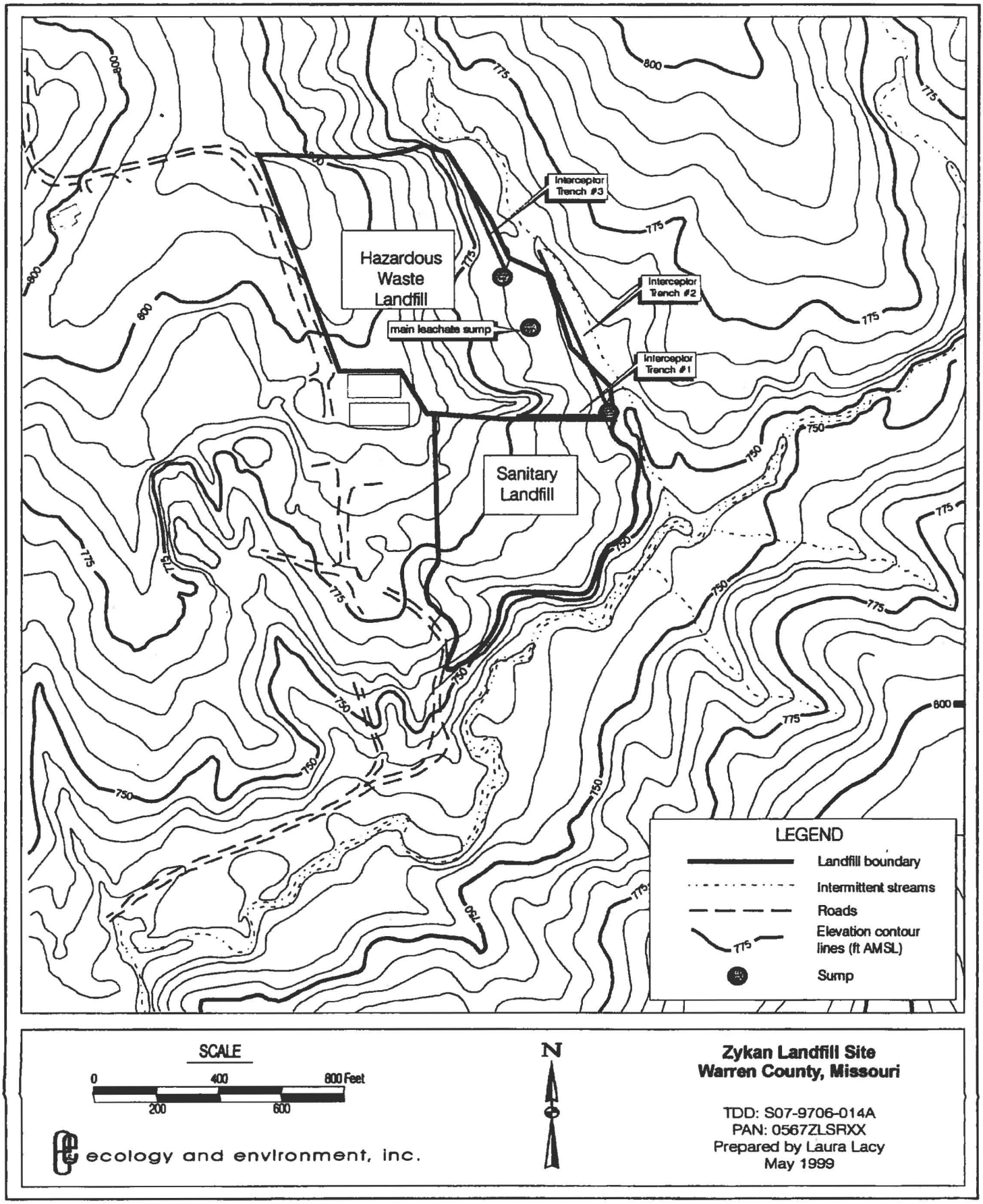
Figure 1: Site Location Map



ZYKSITE2.CDR

Source: Woodward Clyde (1986) RCRA Part B Application

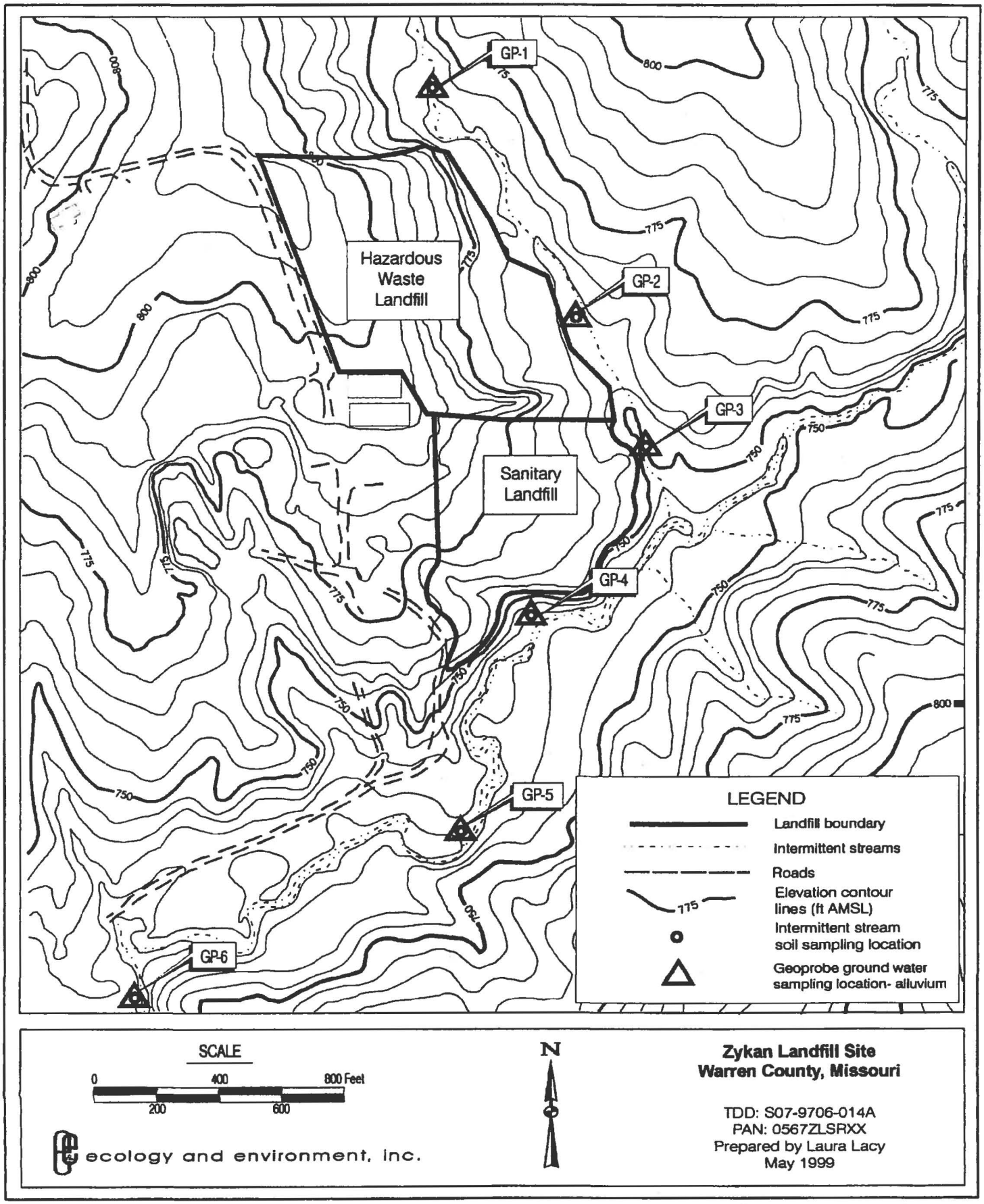
Figure 2: Site Area Map



ZYKSUMP.CDR

Source: Woodward Clyde (1986) RCRA Part B Application

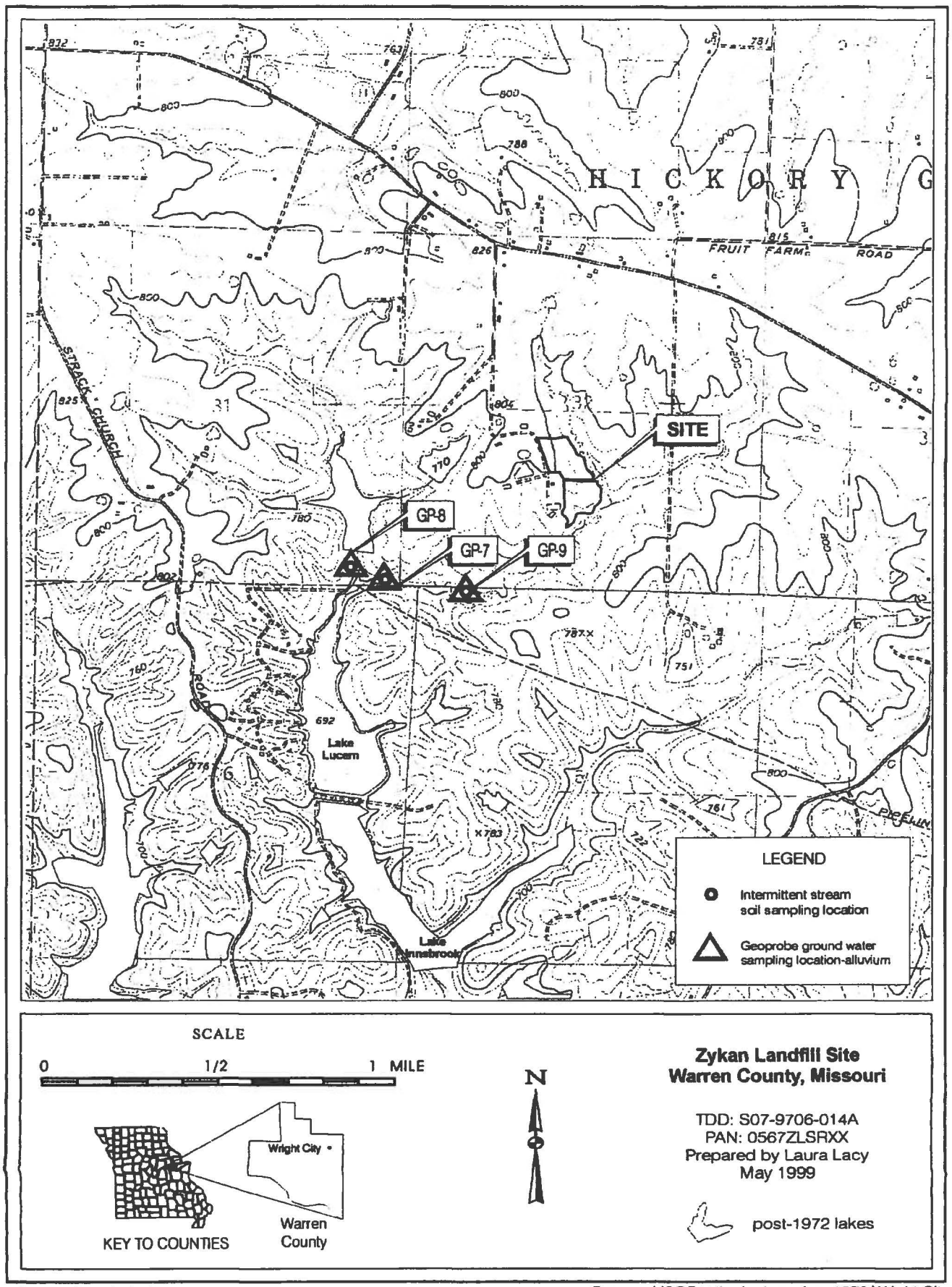
Figure 3: Leachate Sump Sampling Location Map



SAMPLOC1.CDR

Source: Woodward Clyde (1986) RCRA Part B Application

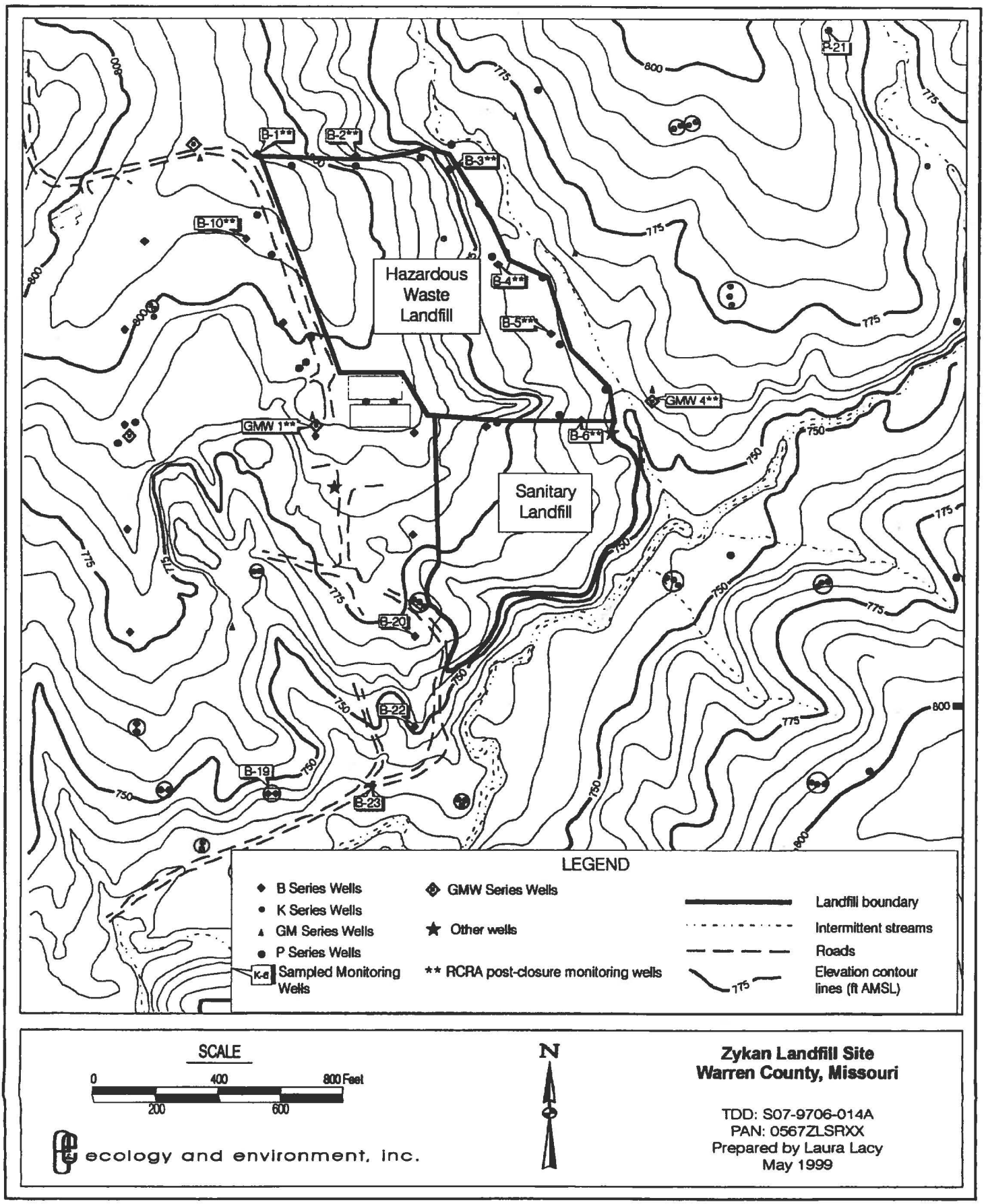
Figure 4: Sampling Location Map-1



g:\9706-014\samploc2.cdr

Source: USGS 7.5 minute series, 1972 Wright City Quadrangle, Missouri with modifications from Village of Innsbrook Map

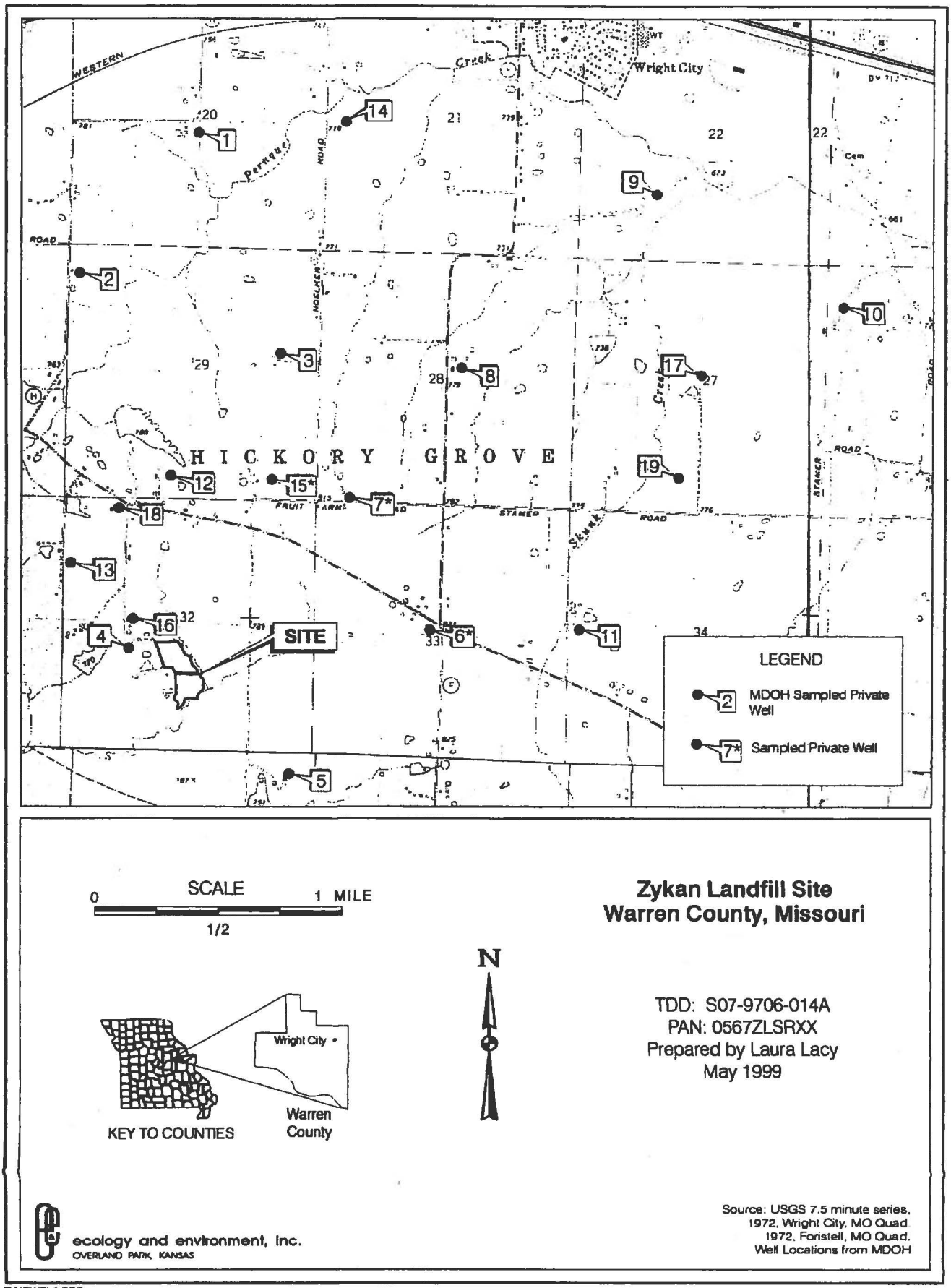
Figure 5: Sampling Location Map-2



ZYKWEL-S.CDR

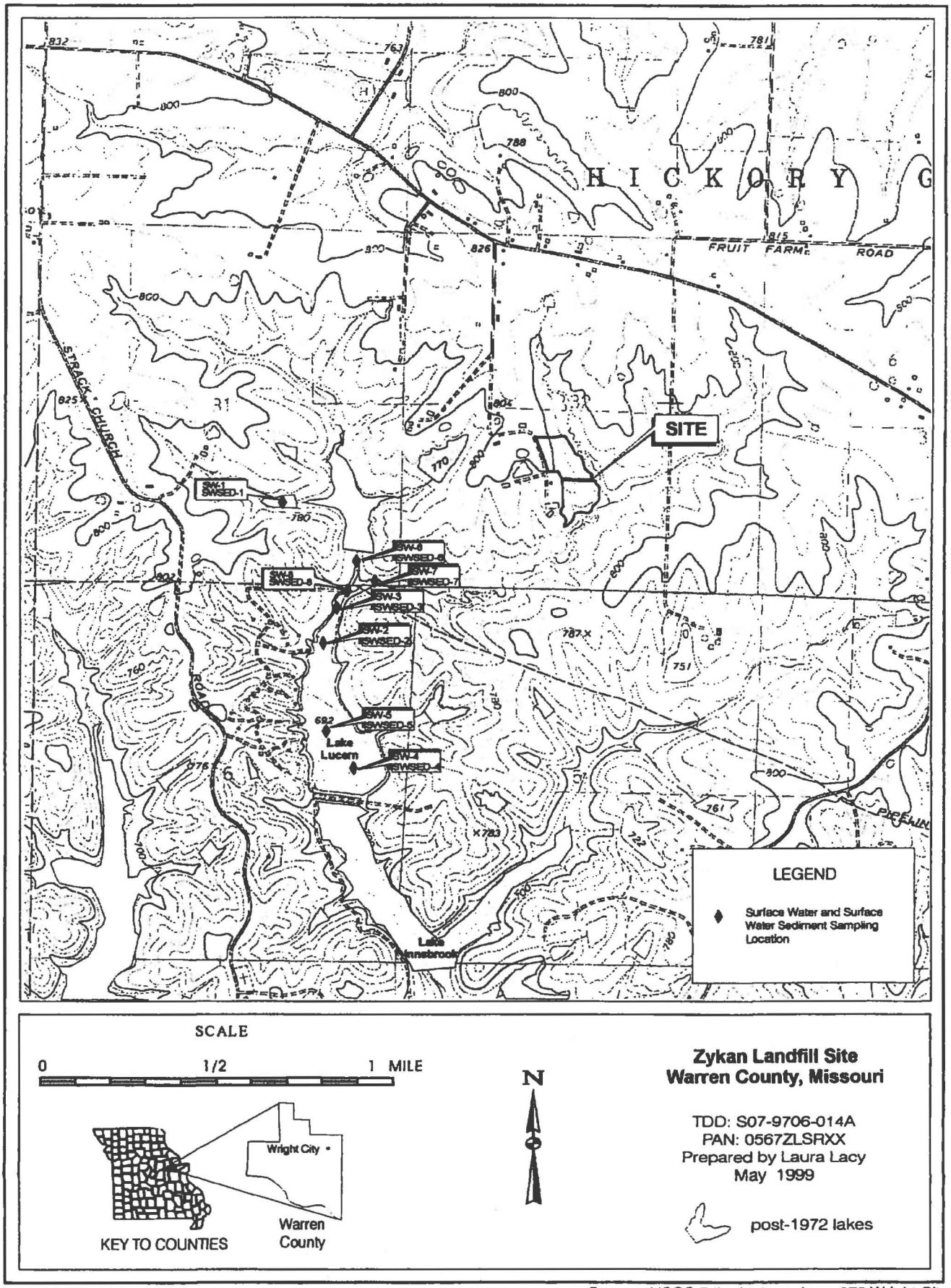
Source: Woodward Clyde (1986) RCRA Part B Application

Figure 6: Monitoring Well Sampling Location Map



ZYKPWEL2.CDR

Figure 7: Private Well Sampling Location Map



g:\9706-014\zyksw.cdr

Source: USGS 7.5 minute series, 1972 Wright City Quadrangle, Missouri with modifications from Village of Innsbrook Map

Figure 8: Surface Water and Surface Water Sediment Sampling Location Map

ATTACHMENT B

Table 1: Analytical Sample Summary
Table 2: Property Owner Information

Table 1

ANALYTICAL SAMPLE SUMMARY

Zykan Landfill Site - Wright City, Missouri

Sampling Source	Sampling Location Figure #	START Sample ID #	EPA Sample (ASYXG-#)	Media	Requested Analysis							Property Owner
					VOC	SVOC	Pest.	Herb.	Tot. Met.	Dis. Met.	Dioxin	
Leachate Sumps	Figure 3	Interceptor Trench #3 Sump	501	Water	X	X	X	X	X	X	X	LaVerne Zykan
		Main Leachate Sump	502		X	X	X	X	X	X	X	
		Interceptor Trenches #1 & #2 Sump	503		X	X	X	X	X	X	X	
Temporary Geoprobe™ Monitoring Wells	Figures 4 & 5	GP-1	401	Water	X	X	X	X	X	X	X	LaVerne Zykan
		GP-2	dry hole		not applicable							
		GP-3	402		X	X	X	X	X	X	X	
		GP-4	403		X	X	X	X	X	X	X	
		GP-5	404		X	X	X	X	X	X	X	
		GP-6	405		X	X	X	X	X	X		
		GP-7	406		X	X	X	X	X	X	X	Innsbrook Corporation
		GP-8	407		X	X	X	X	X	X		
		GP-9	408		X	X	X	X	X	X		
Permanent Monitoring Wells	Figure 6	B-19B	301	Water	X	X	X	X	X	X	X	LaVerne Zykan
		B-23	302		X	X	X	X	X	X		
		B-22	303		X	X	X	X	X	X	X	
		B-20	304		X	X	X	X	X	X		
		GMW-1	305		X	X	X	X	X	X	X	
		B-3	306		X	X	X	X	X	X		
		B-10	307		X	X	X		X	X		
		B-1	308		X	X	X		X	X		
		B-2	309		X	X	X	X	X	X		
		B-4	310		X	X	X	X	X	X		
		B-5	311		X	X	X	X	X	X		
		B-6	312		X	X	X	X	X	X	X	
		P-21	313		X	X	X		X	X		
		GMW-4	314		X	X	X	X	X	X		
Private Wells	Figure 7	#6	701	Water	X	X	X	X	X	X		William Murphy
		#7	702		X	X	X	X	X	X		Jeff Roberts
		#15	703		X	X	X	X	X	X		Jim Fuller
Surface Water	Figure 8	SW-1	101	Water	X	X	X	X	X	X	X	Innsbrook Corporation
		SW-2	102		X	X	X	X	X	X		
		SW-3	103		X	X	X	X	X	X		
		SW-4	104		X	X	X	X	X	X		
		SW-5	105		X	X	X	X	X	X		
		SW-6	106		X	X	X	X	X	X		
		SW-7	107		X	X	X	X	X	X		
		SW-8	108		X	X	X	X	X	X	X	

Table 1

ANALYTICAL SAMPLE SUMMARY

Zykan Landfill Site - Wright City, Missouri

Sampling Source	Sampling Location Figure #	START Sample ID #	EPA Sample (ASYXG-#)	Media	Requested Analysis							Property Owner
					VOC	SVOC	Pest.	Herb.	Tot. Met.	Dis. Met.	Dioxin	
Surface Water Sediment	Figure 8	SWSED-1	201	Soil / Sediment	X	X	X	X	X		X	Innsbrook Corporation
		SWSED-2	202		X	X	X	X	X			
		SWSED-3	203		X	X	X	X	X			
		SWSED-4	204		X	X	X	X	X			
		SWSED-5	205		X	X	X	X	X			
		SWSED-6	206		X	X	X	X	X			
		SWSED-7	207		X	X	X	X	X			
		SWSED-8	208		X	X	X	X	X		X	
Intermittent Stream Bed Soil	Figures 4 & 5	ISS-1	601	Water	X	X	X	X	X		X	LaVerne Zykan
		ISS-2	602		X	X	X	X	X			
		ISS-3	603		X	X	X	X	X		X	
		ISS-4	604		X	X	X	X	X			
		ISS-5	605		X	X	X	X	X			
		ISS-6	606		X	X	X	X	X		X	
		ISS-7	607		X	X	X	X	X			Innsbrook Corporation
		ISS-8	608		X	X	X	X	X			
		ISS-9	609		X	X	X	X	X			
Trip Blanks	NA	Trip Blank	801-F	Water	X							NA
		Trip Blank	805-F		X							
		Trip Blank	806-F	Soil / Sediment	X							
Field Blank	NA	Field Blank	803 -F	Water	X	X	X	X	X	X		
Rinsate	NA	Geoprobe™ Rinsate	802	Water	X	X	X	X	X	X		
Decon. & Purge Water	NA	Decon. & Purge Water Composite	804	Water	X	X	X	X	X	X		

Table 2

PROPERTY OWNER INFORMATION

Zykan Landfill Site - Wright City, Missouri

Property Owner	Address	Phone #
LaVerne Zykan	1180 Jefferson - B, Washington, MO 63090	unavailable at time of trip report
Innsbrook Corporation	Attn: Les Bechele, #1 Innsbrook Estates, Innsbrook, MO 63390	(314) 928-3366 x-555
William Murphy	12 West Highway M, Wright City, MO 63390	(314) 745-3588
Jeff Roberts	133 Fruit Farm Road, Wright City, MO 63390	(314) 745-2060
Jim Fuller	241 Fruit Farm Road, Wright City, MO 63390	(314) 745-3659